14. On some new Carnivorous Therapsids in the Collection of the British Museum. By R. Broom, D.Sc., M.D., C.M.Z.S.

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(Text-figures 1–8.)

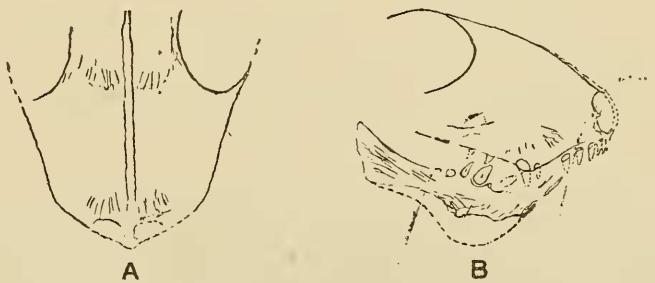
Index.

At the suggestion of Dr. C. W. Andrews I recently examined all the specimens of carnivorous Therapsid reptiles in the British Museum, and was fortunate in finding a considerable number of new types sufficiently well preserved to be worthy of description.

Simorhinella baini, gen. et sp. n. (Text-fig. 1.)

This new genus and species is founded on a small specimen obtained by Mr. T. Bain in the Gouph, S. Africa, and procured by the British Museum in 1878. From the nature of the matrix I think it probable that it is from the *Pareiasaurus* zone, but it may possibly be from the *Endothiodon* zone.

Text-figure 1.



Simorhinella baini.

A. Upper view of snout, nat. size. B. Side view of snout, nat. size. B.M. 49422.

The specimen consists of the anterior half of the skull of a small carnivorous Therapsid, much weathered, and with the bones

crackled after the manner of a septarian nodule. It is practically impossible to make out the limits of the various cranial elements, but the general structure can readily be seen.

The type is specially remarkable for the shortness and breadth of the snout and for the small size of the teeth.

The length from the front of the orbit to the premaxilla as preserved is 21 mm., and though the internasal process is lost, when allowance is made for the crushing, the original length was probably not more than 22 mm. The width of the snout at the plane of the front of the orbit is 28 mm.

The premaxillaries are small, and each has four small rounded incisors.

The septomaxillary is of the typical Therocephalian and Gorgonopsian type, a rounded foramen being found between it and the maxilla.

The nasals are large and fairly broad.

The frontals are moderately large, the interorbital measurement being 14·5 mm. as preserved. Originally the measurement was probably a little less.

The maxilla is well developed and largely overlaps the premaxilla in front. It carries two canines and probably three molars.

The mandible is not well preserved. The symphysis is broad and probably deep. There are apparently three incisors, one canine, and three molars.

The four upper incisors measure about 8 mm. The diastema between i^4 and c^1 is 3 mm. The two canines measure 3·5 mm., the larger c^2 being only 1·8 mm.

The lower incisors measure about 8 mm. The canine has a diameter of about 1·6 mm., and the three lower molars measure 4·5 mm. From i^3 to the back of m^3 is 9 mm.

If the above determinations are correct the dental formula would be $i\ \frac{4}{3},\ c\ \frac{2}{1},\ m\ \frac{3}{3}$.

The nearest affinities of *Simorhinella* are probably with *Ictidognathus* and *Scaloposaurus*, and with the next described form *Icticephalus*.

The type is a young animal in which there is clear evidence of dental succession.

The specimen is registered No. 49422.

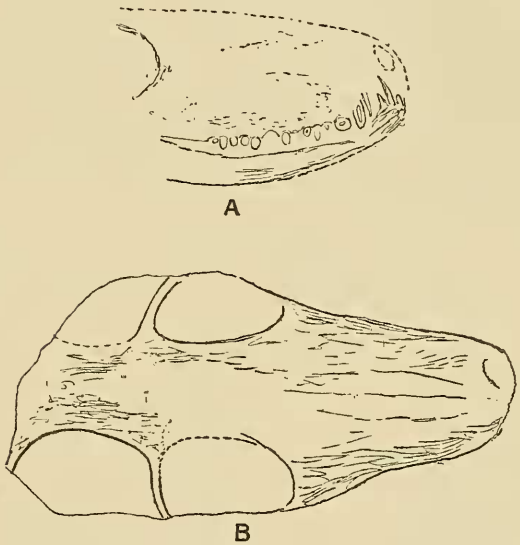
Icticephalus polycynodon, gen. et sp. n. (Text-fig. 2.)

This new genus and species is represented by one specimen in the British Museum, and one in the South African Museum, Capetown. The British Museum specimen is a fairly complete but very badly weathered skull: the Capetown specimen is the front half of the skull, also much weathered, but showing most of the maxillary teeth in fairly good condition. While I do not consider that there is the least doubt but that the two specimens belong to the same species, as the Capetown specimen has the

teeth so much better preserved it will be better to regard it as the holotype, and the British Museum specimen as a paratype.

The British Museum specimen shows the skull to be at least 68 mm. in length. When complete it probably measured 75 mm. The greatest breadth was probably about 40 mm. The orbit looks upwards and outwards, and measures about 18 mm. in diameter. From the front of the orbit to the front of the snout is about 33 mm. The interorbital measurement is 18 mm., and the intertemporal about 8 mm. There is no pineal foramen. The postorbital arch is delicate but complete,

Text-figure 2.



Icticephalus polycynodon.

A. Side view of type in S. Afr. Mus. Coll. B. Upper view of skull in B.M. Coll. which forms a paratype. B.M. R.4096. Both nat. size.

The upper incisors are lost from the Capetown specimen, but remains of most are seen in the British Museum specimen. There are apparently six, and together they measure 8 mm. Behind i^6 there is a diastema of 1·5 mm. There are three small canines. The first is less than 1 mm. in diameter, the other two have each an antero-posterior length of about 2 mm., and the third, nearly perfect on the left side, has a height of about 7 mm. The three canines together measure 6 mm. The first molar is less than 1 mm. behind the last canine. There are altogether eleven small, pointed, rounded, and unserrated molars,

of which the 5th, 6th, and 7th are larger than the others. The whole series measures 16 mm.

The nearest ally of this type is *Scaloposaurus*. From this genus it differs in having 11 molars instead of 9, and in having the postorbital arches completely formed.

The British Museum specimen is registered R. 4096.

Cerdodon tenuidens, gen. et sp. n. (Text-fig. 3.)

This new genus and species is founded on a specimen collected by Mr. T. Bain in the Gouph, S. Africa, in 1878. It consists of the greater part of the somewhat crushed and imperfect skull of a small Therocephalian. The specimen is in a hard nodule, and only the left side has been displayed. The front of the snout is for the most part weathered away, and the supra- and post-orbital portions of the skull are either hidden in the nodule or possibly missing. Still, the whole of the left maxilla and most of the left jugal are fairly well preserved, and most of the left dentary and a considerable part of the left angular.

From the front of the orbit to the front of the maxilla is 39 mm., and the measurement to the front of the snout was probably about 47 mm.

Text-figure 3.

Cerdodon tenuidens.

Side view of skull as preserved. Nat. size. B.M. 49420.
Ju. Jugal; *L.* Lacrymal; *Mx.* Maxilla.

The front of the snout is too imperfect to show the number of incisors. There probably were five. Those remaining are slender, pointed teeth. The canine is relatively small, measuring 4·5 mm. in length and about 12 mm. in height. The molars are not well preserved, but they are evidently numerous—possibly seven or eight. Two of these in the upper jaw are each over 2 mm. in diameter; but what are probably the posterior three in the lower jaw are small, and together occupy a space of only 4·5 mm.

The lower jaw is slender, with a low symphysis. There appear to be three incisors occupying a space of 6·5 mm. In the specimen it looks as if there were four incisors, but the front one is probably the first incisor of the right jaw. The canine is unusually small. The total length from the first incisor to the last molar is 30 mm.

The nearest ally to *Cerdodon tenuidens* is *Ictidosuchus primævus*, described by me fourteen years ago. I think there is little doubt but that the two belong to the same family of Therocephalians—the Ictidosuchidæ.

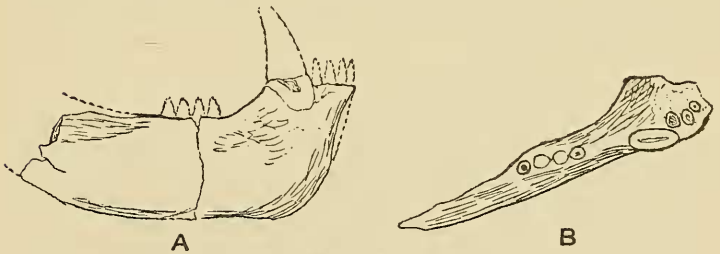
The British Museum Register number of the specimen is 49420.

Cyniscodon lydekkeri, gen. et sp. n. (Text-fig. 4.)

This new genus and species is founded on an imperfect right dentary discovered by Mr. T. Bain at "Palmietfontein, Cape Colony." There are many Palmietfonteins in the Karroo, but it is probable that the specimen is from the Palmietfontein in the Beaufort West district, and in the *Pareiasaurus* zone.

Associated with the jaw is much of the skeleton of a small *Dicynodon*. There is a large part of the skull, including most of the occiput, much of the left squamosal and most of the left orbital region, and much of one mandible. There are a series of vertebræ, the right scapula, parts of the sacrum, and much of the right side of the pelvis.

Text-figure 4.



Cyniscodon lydekkeri.

A. Side view of right dentary. B. Upper view of right dentary. Both nat. size. B.M. 49409.

The specimens were examined by Lydekker and described by him in the British Museum Catalogue of Fossil Reptiles, vol. iv. p. 72, all the specimens being supposed to belong to one individual. The dentary with teeth is in the same matrix, and was probably picked up near the small *Dicynodon* skeleton, such an association of bones being by no means uncommon in the Karroo.

The dentary was thought by Lydekker to belong possibly to *Cynosuchus suppostus* Owen, to which it unquestionably has much

superficial resemblance. As, however, it has a different dental formula and must be placed in a distinct genus, I have much pleasure in proposing for it the name *Cyniscodon lydekkeri*.

Cynosuchus suppostus, with which this new form has been confused, is known only by the imperfect type skull. It is a most remarkable form, having cusped molars and a secondary palate like the typical Cynodonts, but in other respects differing from all known Cynodonts and resembling more the Gorgonopsians. The dental formula is probably $i\ \frac{4}{3}$, $c\ \frac{1}{1}$, $m\ \frac{7}{7}$, and to whatever suborder a more complete skull may show it to belong, it must be placed in a distinct family—the Cynosuchidæ.

In *Cyniscodon lydekkeri* the dentary is considerably smaller than in *Cynosuchus suppostus*. It has the deep symphysis characteristic of the Gorgonopsians. In the specimen as preserved are the roots of three incisors which are probably i^2, i^3, and i^4. Together they measure 5 mm. The whole four probably measured 7 mm. The canine measures at its base 6 mm. × 3·2 mm. Behind the canine is a diastema of 7 mm., followed by four molars which together measure 9 mm. They are small and rounded, and about equal in size.

Cyniscodon in the general structure of the jaw resembles most the small Gorgonopsians such as *Ælurosaurus*, but differs from them in having a loose symphysis, and in being smaller than any of the known Gorgonopsians.

The specimens described by Lydekker have the Register number 49404, but as this is now seen to include two different animals the number 49404 will be retained for the type of *Cyniscodon lydekkeri*, and the small *Dicynodon* skeleton will be numbered 49404 *a*.

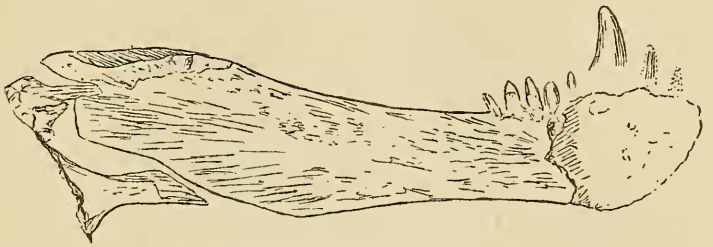
Cerdognathus greyi, gen. et sp. n. (Text-fig. 5.)

The type of this new genus and species is an imperfect lower jaw obtained by Sir G. Grey at Klippoort, in the Cradock district. The left dentary is nearly complete, and there is a fragment of the surangular and of the angular. The front portion of the dentary is represented only by an imperfect impression.

The contour of the jaw is unlike that of any previously described form. There were probably four incisors, of which there are preserved only the obscure impressions of two. There is a single moderately large canine and five molars. The molars are small and uncusped. The whole dentary is unusually straight, there being no great deepening of the symphysis, and the coronoid process does not rise greatly from the line of the horizontal ramus. From the symphysis to the point where the dentary meets the upper border of the surangular, the measurement is probably about 105 mm., and the depth at the last molar about 15 mm. From the upper side of the surangular to the notch in front of the descending wing of the angular the measurement is 23 mm.

The length of the canine is probably about 7·5 mm., and the height 13 mm. There is only a very short diastema of 1 mm. between c and m^1. The five molars measure 14 mm.

Text-figure 5.



Cerdognathus greyi.

Inner view of left mandible as preserved. Slightly reduced.
B.M. R. 2892.

The specimen is probably a Gorgonopsian, but differs from all known forms in having the first molar close to the canine and in the relatively shallow symphysis.

The specimen is registered No. R. 2892.

Scymnosaurus watsoni, sp. n. (Text-fig. 6.)

This new species is founded on a large skull discovered by Mr. T. Bain on the farm Uitkyk, in the Gouph.

Mr. D. M. S. Watson has recently published a restoration of the palate (P. Z. S. 1914, p. 1035), and has doubtfully referred the specimen to *Lycosuchus vanderrieti*. The skull has been considerably further developed by the British Museum preparator Mr. Hall, and it becomes quite manifest that it cannot belong to the genus *Lycosuchus*. Unfortunately the front part of the snout is missing, so that nothing is known of the incisors, but a large part of each canine is preserved and sufficient of the molars to indicate their number. Except for the missing premaxillary region, the skull shows all the main points of structure.

The principal characteristics of the skull are the great size of the temporal fossæ, the narrowness of the snout, and the presence of a narrow high parietal crest.

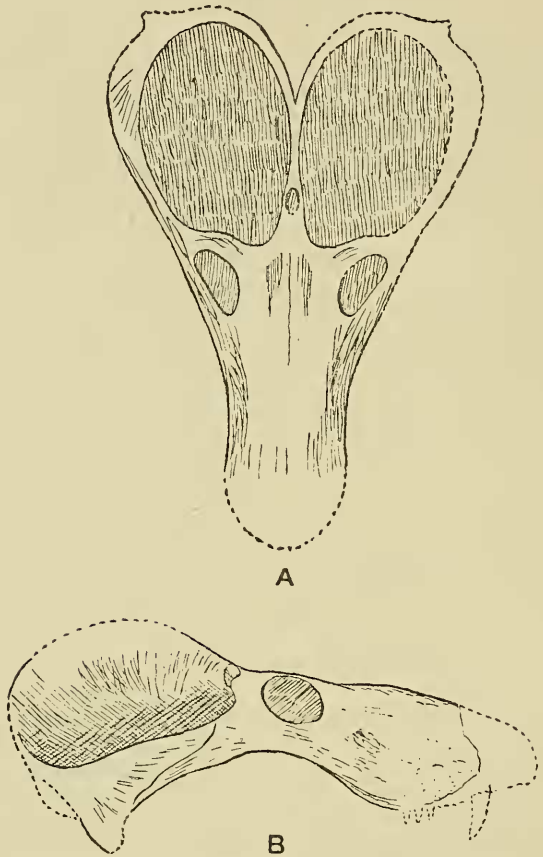
The following are the chief measurements:—

Greatest length of the skull	(probably)	290 mm.
Greatest width		208
Front of temporal fossa to back of squamosal.....		128
Interorbital width		50
Back of canine to back of m^3.....	(probably)	32
Length occupied by the three molars		22

There are three small molars which have their crowns much flattened, and are probably serrated both in front and behind—

certainly in front. The palate, as shown by Watson, is of the Therocephalian type seen in *Scylacosaurus*, there being a pair of prevomers and large suborbital vacuities.

Text-figure 6.



Scymnosaurus watsoni.

A. Upper view of skull. B. Side view of skull. $\frac{1}{4}$ nat. size.
B.M. R. 4100.

It is difficult to make out the sutures in the preorbital region. In front of the orbit there is a marked depression. The post-orbital bone forms a distinct crest along part of the anterior temporal border, but only passes a very short distance back on the parietal crest.

The parietal forms a deep and high narrow crest which extends back a considerable distance behind the pineal foramen, and then

divides into a pair of crests which curve round behind the large temporal fossæ to meet the squamosals.

The squamosal is a large bone which forms much of the posterior surface of the skull. It passes well downwards, and covers most of the relatively small quadrate. Internally it meets the parietal above, and is closely articulated to the tabulare.

The tabulare is a moderate-sized element, but its lower and outer portions are not preserved. It articulates with the parietal above and the interparietal internally, and overlaps the squamosal externally.

The interparietal is a small median element.

As Watson has already described the palate, it will be unnecessary to say anything further about it.

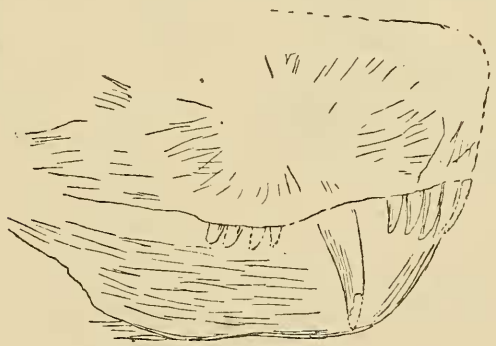
The genus *Scymnosaurus* was founded on a large snout in the South African Museum which was made the type of *S. ferox*. Some years later, a much smaller snout from Natal was named *S. warreni*. In both these species the dental formula is i^5, c^1, m^3. In the new species the formula is i^3, c^1, m^3, and though in the absence of the snout of *S. watsoni*, and knowing little except the snouts of the others, there is doubt about all belonging to the same genus, it seems safest at present to refer the new species to *Scymnosaurus*, to which in any case it is certainly closely allied.

The type is numbered R. 4100 in the British Museum Register.

Scymnognathus parvus, sp. n. (Text-fig. 7.)

The type of this new species is a specimen found by Mr. D. M. S. Watson at Kuilspoort, Beaufort West district, and probably from the upper part of the *Endothiodon* zone.

Text-figure 7.



Scymnognathus parvus.

Side view of snout. ½ nat. size. B.M. R. 4139.

The specimen consists of the nearly complete skull of a small Gorgonopsian and a few associated fragments. The skull is

much crushed obliquely and the occiput is further crushed forwards, so that though the jaws with most of the teeth are in fairly good condition, little of the structure of the upper part of the skull can be satisfactorily made out.

As the teeth agree in number and structure with those of *Scymnognathus whaitsi* and other known species, and so far as can be seen the skull of this new form does not differ greatly, I refer the new species to this genus and call it *S. parvus*.

The total length of the lower jaw is about 170 mm., and the skull probably measured 190 mm.

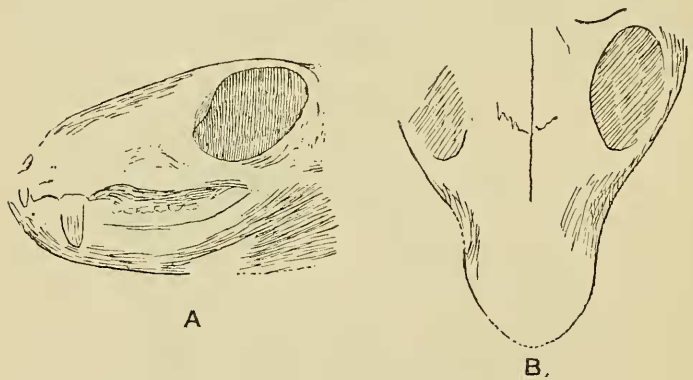
The five incisors measure 25 mm. Between i^5 and the canine is a diastema of 12 mm., and the canine measures 10 mm., followed by a diastema of 10 mm. The four molars measure 19 mm. In *S. minor*, the nearest allied species, the five incisors measure 33 mm., and the four molars 21 mm.

The specimen is numbered R. 4139 in the British Museum Register.

Trirachodon browni, sp. n. (Text-fig. 8.)

This new species is founded on the anterior two-thirds of a small skull discovered by Mr. Alfred Brown at Aliwal North. The skull is well preserved, but owing to the lower jaws being closely fixed to the upper, the crowns of all the molars are hidden.

Text-figure 8.



Trirachodon browni.

A. Side view of snout. B. Upper view of snout. Nat. size.
B.M. R. 3307.

It is not improbable that when a specimen is discovered which shows the crowns of the molars, this species may have to be placed in a new genus, but as it is certainly a near ally of *Trirachodon* and possibly belongs to this genus, I have provisionally placed it so.

It certainly is a new species, and I have much pleasure in naming it after my old friend, Mr. Brown.

Only a very few of the sutures can be clearly made out, but so far as can be seen the structure of the skull is very similar to that of *Trirachodon kannemeyeri* Seeley.

The following are the principal measurements of the skull :—

Snout to front of orbit		27 mm.
Antero-posterior diameter of orbit		18
Interorbital measurement		16
Length of canine		4
Height of canine		10
Molar series	(probably)	18

In *Trirachodon kannemeyeri* Seeley, the seven largest molars measure 21–22 mm. ; in *T. minor* Broom, they measure 18·5 mm. in *T. browni* they measure 14 mm.

The type skull is numbered R. 3307 in the B.M. Register.